WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005TX196B

Title: Watershed Development and Climate Change Effects on Environmental Flows and Estuarine Function

Project Type: Research

Focus Categories: Surface Water, Law, Institutions, and Policy, Water Quantity

Keywords: Environmental flows, freshwater inflow, coastal-watershed interactions

Start Date: 03/01/2005

End Date: 02/28/2006

Federal Funds: $5,000

Non-Federal Matching Funds: $10,000

Congressional District: 27th

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Abstract

This project will create a hydrologic model that can be used to predict and assess how changes in hydrology might affect the ecological function of estuaries. The hydrologic modeling work is part of a larger effort that also involves developing ecological indicators of estuary functions. When completed, the hydrology model will be linked to a biological model that examines ecosystem functions. The thrust of this work centers around developing research tools to examine how watershed development and climate change influence the function of estuaries. To do this, net ecosystem metabolism will serve as the key indicator of ecosystem function. The net ecosystem function model will be linked to watershed-scale precipitation patterns, landscape characteristics, and hydrology through the use of geographic information systems and hydrological modeling tools developed by the Center for Research in Water Resources at the University of Texas at Austin. Models that will be used in this project include the ArcView geographic information system and the U.S. Army Corps of Engineers HEC-HMS model. The research will produce a three-dimensional model that can estimate how shallow waters in estuaries may be affected by reductions in inflows. Ultimately, the linked hydrological

and biological models will provide a powerful tool to help accurately project how present changes in freshwater inflow, as well as anticipated future reductions, influence the ecology of bays and estuaries.